

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number
WO 2004/113549 A1

(51) International Patent Classification⁷: **C12P 7/06**, 5/02

(21) International Application Number:
PCT/EP2004/006700

(22) International Filing Date: 21 June 2004 (21.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
103 27 954.7 20 June 2003 (20.06.2003) DE
60/499,379 3 September 2003 (03.09.2003) US

(71) Applicants and

(72) Inventors: **WILKENING, Carl, Ludwig** [DE/DE]; Öst-
bergweg 9, 30559 Hannover (DE). **WILKENING, Ludz**
[DE/DE]; Im Mehlhof 20, 29351 Eldingen-Ziegelei (DE).

(74) Agents: **MENGES, Albrecht, V. et al.**; Uexküll & Stol-
berg, Beselerstr. 4, 22607 Hamburg (DE).

(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: IMPROVED METHODS FOR PRODUCING ETHANOL AND METHANE FROM BIOMASS

(57) Abstract: The present invention relates to methods for producing ethanol and methane from biomass. The clear phase of a pulp obtained by fermentation of milled biomass is used for obtaining methane gas for energy production and for conversion in a combined heat and power production of energy and steam. The anaerobically purified clear phase of the pulp can additionally be purified aerobically to enable reuse of the water in the process. The solid phase of the pulp can be utilized for obtaining a high quality feeding stuff or burned for production of energy.

WO 2004/113549 A1